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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/748,434  | 12/30/2003  | Tomohisa Honda       | CU-3529 RJS         | 8115             |
| 26530   | 7590        | 04/27/2005           | EXAMINER            |                  |
| LADAS & PARRY LLP<br>224 SOUTH MICHIGAN AVENUE<br>SUITE 1200<br>CHICAGO, IL 60604 |             |                      | SCHECHTER, ANDREW M |                  |
|   |             |                      | ART UNIT            | PAPER NUMBER     |
|   |             |                      | 2871                |                  |

DATE MAILED: 04/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                              |                     |  |
|------------------------------|------------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b>       | <b>Applicant(s)</b> |  |
|                              | 10/748,434                   | HONDA ET AL.        |  |
|                              | Examiner<br>Andrew Schechter | Art Unit<br>2871    |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 30 December 2003.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-8 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) 2,5,7 and 8 is/are allowed.  
 6) Claim(s) 1 and 4 is/are rejected.  
 7) Claim(s) 3 and 6 is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 30 December 2003 is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1.) Certified copies of the priority documents have been received.  
 2.) Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3.) Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____. | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|   | 6) <input type="checkbox"/> Other: _____.                                   |

## **DETAILED ACTION**

### ***Drawings***

1. Figure 3 should be designated by a legend such as --Prior Art-- or --Related Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: "Monochrome liquid crystal display having higher spacers in pixel area than in peripheral area and production method therefor".

### ***Claim Objections***

3. Claims 4-6 and 8 are objected to because of the following informalities: "IPS type" should be "IPS" since "type" tends to make the language indefinite [see MPEP 2173.05(b)]. Appropriate correction is required.

4. Claims 1, 2, and 7 are objected to because of the following informalities: "in the area with the black matrix formed of the protection layer" should be "formed in the area with the black matrix and formed on the protection layer". Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Hiroshima et al.*, US 2003/0025868 in view of *Morimoto*, U.S. Patent No. 5,659,379 and further in view of *Okamoto et al.*, U.S. Patent No. 6,281,952.

*Hiroshima* discloses [see Fig. 1, for instance] a substrate for a liquid crystal display apparatus comprising a substrate [SUB2], a black matrix [BM] formed in a pattern on the substrate, a protection layer [OC2] formed on the substrate so as to cover the black matrix, and a columnar spacer [SP1, SP2] formed in the area with the black matrix and formed on the protection layer, for adjusting the gap between the substrate and the counter substrate [SUB1], wherein the height from the surface of the substrate to the upper surface of the columnar spacer [SP1] provided in the pixel part of the substrate is higher than the height from the substrate surface to the upper surface of

the columnar spacer [SP2] provided in the outer peripheral part as the pixel part peripheral area of the substrate.

*Hiroshima* discloses that the height difference is given by the thickness of the counter electrode [ITO2], but does not disclose what this thickness is. *Morimoto* discloses an analogous counter electrode for an analogous device, and teaches that its thickness is “preferably controlled within the range of 1300-1700 [Angstroms] in consideration of the resistance of the counter electrode ... itself and for prevention of moiré” [col. 7, lines 54-57]. It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to make the height difference within the recited range of 0  $\mu\text{m}$  to 0.8  $\mu\text{m}$ , motivated by *Morimoto*’s teaching for what the thickness of the counter electrode should be.

*Hiroshima* does not disclose that the LCD is monochrome; instead, it discloses color filters [FIL]. However, [unlike US 2003/0112405 to *Kim et al.*, discussed below] the color filters are not related to the spacer structures, so they are not essential to *Hiroshima*’s invention. *Okamoto* discloses [col. 87, lines 27-36] that LCDs can be made without color filters, and thereby obtain a higher resolution monochrome display. It would have been obvious to one of ordinary skill in the art at the time of the invention to form the monochrome version of *Hiroshima*’s device, motivated by the desire to obtain a higher resolution display. Claim 1 is therefore unpatentable.

7. Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Kim et al.*, U.S. Patent No. 6,819,391 in view of *Okamoto et al.*, U.S. Patent No. 6,281,952.

*Kim* discloses [see Fig. 4B, for instance] a substrate for a liquid crystal display apparatus comprising a substrate [200], a black matrix [210] formed in a pattern on the substrate, a protection layer [240] formed on the substrate so as to cover the black matrix, and a columnar spacer [250, 260] formed in the area with the black matrix and formed on the protection layer, for adjusting the gap between the substrate and the counter substrate [100], wherein the height from the surface of the substrate to the upper surface of the columnar spacer [250] provided in the pixel part of the substrate is higher than the height from the substrate surface to the upper surface of the columnar spacer [260] provided in the outer peripheral part as the pixel part peripheral area of the substrate by in a range of 0  $\mu\text{m}$  to 0.8  $\mu\text{m}$  [in this case 0  $\mu\text{m}$ , since they are explicitly the same height].

*Kim* does not disclose that the LCD is monochrome; instead, it discloses color filters [220]. However, [unlike US 2003/0112405 to *Kim et al.*, discussed below] the color filters are not related to the spacer structures, so they are not essential to *Kim's* invention. *Okamoto* discloses [col. 87, lines 27-36] that LCDs can be made without color filters, and thereby obtain a higher resolution monochrome display. It would have been obvious to one of ordinary skill in the art at the time of the invention to form the monochrome version of *Kim's* device, motivated by the desire to obtain a higher resolution display. Claim 1 is therefore unpatentable.

*Kim's* device is an IPS LCD [col. 5, lines 35-36], so claim 4 is also unpatentable.

***Allowable Subject Matter***

8. Claims 3 and 6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
9. Claims 2, 5, 7, and 8 are allowed.
10. The following is a statement of reasons for the indication of allowable subject matter:

The prior art does not disclose the device of claim 2, in particular the limitations that a monochrome LCD has a columnar pixel spacer with a higher height than a columnar outer peripheral spacer. Claim 2 is therefore allowed, as is its dependent claim 5. (Note, however, the objections to claims 2 and 5 above.)

Similarly, the prior art does not disclose claim 3, containing these limitations, so claim 3 and its dependent claim 6 would be allowable if rewritten appropriately. (Note, however, the objection to claim 6 above.)

The prior art does not disclose the method of claim 7, in particular the limitations that a monochrome LCD is made with the steps of forming a columnar spacer in the outer peripheral part of the display first, and then forming a columnar spacer in the pixel part of the display. Claim 7 is therefore allowed, as is its dependent claim 8. (Note, however, the objection to claim 8 above.)

### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 2003/0112405 to *Kim et al.* discloses an LCD in which the height from the surface of the substrate to the upper surface of the columnar spacer is higher in the pixel part of the display than in the outer peripheral part of the display, as recited in claim 1. However, the display is not a monochrome display, and the difference in height relies on the presence of color filter layers, so it would not be obvious to one of ordinary skill in the art at the time of the invention to apply this feature in a monochrome display or make a monochrome version of this display. (The term "monochrome" in the preamble of each independent claim has a clear structural implication for the claims: a monochrome display does not have any color filter layers, so devices with such color filter layers are outside the scope of the claims.)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Schechter whose telephone number is (571) 272-2302. The examiner can normally be reached on Monday - Friday, 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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25 April 2005